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(54) Title of the invention: Method for processing ether signal, base station and subscriber's station
(57) Abstract:
Problem to be solved: To provide a method for processing an Ether signal which can reduce the CPU load of a base station, and to provide the base station and a subscriber's station.
Solution: The method for processing the Ether signal for a system for transferring data at a terminal connected to the network and the subscriber's station, by radio communicating the base station connected to the network and a plurality of the subscriber's stations in a time division multiple access system includes the subscriber's station specifying step of specifying the subscriber's station, by using a VLAN tag of the Ether

signal with the VLAN tag to be transmitted from the network by the base station, the transfer step of transferring the Ether signal with the VLAN tag to the specified subscriber's state by the base station, and the deleting step of deleting the VLAN tag of the Ether signal with the VLAN tag transferred from the base station by the subscriber's station.

[Claims]

[Claim 1] An Ether signal processing method in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station when a base station characterized by that connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access performs data transfer, including a subscriber station specific step as which the mentioned above base station specifies the mentioned above subscriber station using a VLAN tag of an Ether signal with a VLAN tag transmitted from a network, a transfer step to which the mentioned above base station transmits an Ether signal with a VLAN tag transmitted to the mentioned above specified subscriber station from the mentioned above network and a deletion step from which the mentioned above subscriber station deletes a VLAN tag of an Ether signal with a VLAN tag transmitted from the mentioned above base station.

[Claim 2] The Ether signal processing method according to claim 1including a step at which the mentioned above subscriber station transmits an Ether signal transmitted from a terminal accommodated in this subscriber station to the mentioned above base station, a step to which the mentioned above base station gives a VLAN tag to an Ether signal transmitted from the mentioned above subscriber station and a step at which the mentioned above base station transmits an Ether signal with which this VLAN tag was given to the mentioned above network.
[Claim 3] An Ether signal processing method in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station when a base station characterized by that connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access performs data transfer, including a step in which an Ether signal with a VLAN tag transmitted from the mentioned above network is divided into a fixed-length radio MAC frame, this base station gets down, and the mentioned above base station stores in a buffer, a step that it gets down for the subscriber stations the mentioned above VLAN tag indicates the mentioned above a plurality of divided radio MAC frames to be with reference to a VLAN-subscriber station correspondence table and the mentioned above base station stores in a

subscriber station buffer, a step to which the mentioned above base station adds re-synthetic information for a subscriber station which receives a MAC frame of this plurality to compound a MAC frame of these plurality to the mentioned above a plurality of MAC frames, a step that transmits a plurality of MAC frames to which the mentioned above base station added the mentioned above re-synthetic information to a subscriber station which the mentioned above VLAN tag shows, a step to which the mentioned above subscriber station receives a MAC frame transmitted from the mentioned above base station, a step in which the mentioned above subscriber station compounds the mentioned above a plurality of received MAC frames based on the mentioned above re-synthetic information and generates the mentioned above Ether signal with a VLAN tag. When the mentioned above subscriber station deletes a VLAN tag from the mentioned above generated Ether signal with a VLAN tag and performs shifting data, a step that generates a VLAN Ether signal without tag, and a step in which the mentioned above subscriber station transmits the mentioned above generated VLAN Ether signal without tag to a terminal accommodated in this subscriber station.
[Claim 4] When a base station connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access, a terminal

connected to the mentioned above network and the mentioned above subscriber station is the mentioned above base station in a system that performs data transfer, including a network interface part, a going down MAC scheduling processing part, an up MAC scheduling processing part, a TDMA/TDD control part, and a modulation and demodulation part, and the mentioned above network interface part, gets down and an Ether signal with a buffer, a going up buffer, and a VLAN tag is divided into a radio MAC frame, go up the mentioned above Ether signal with a VLAN tag that it gets down and is transmitted to a buffer and that gets down and is transmitted from processing and mentioned below U-CPU, and it stores in a buffer, including E-CPU part that performs going up processing that transmits a stored this Ether signal with a VLAN tag to a network, and the mentioned above going down MAC scheduling processing part, a going down subscriber station buffer prepared for each subscriber station and wireless data are stored in the mentioned above going down subscriber station buffer, performs scheduling processing that defines turn which transmits stored this wireless data to each subscriber station, gives a header area to a radio MAC frame, and it includes D-CPU part transmitted to a TDMA/TDD part, an up subscriber station buffer with which the mentioned above up MAC scheduling processing part is prepared for each subscriber station,

and a plurality of radio MAC frames transmitted from TDMA/TDD are stored in the mentioned above up subscriber station buffer, compound a plurality of stored this radio MAC frames, generates an Ether signal, and a subscriber station number of a subscriber station and a VLAN-subscriber station correspondence table that transmitted a radio MAC frame of this plurality are referred to, gives a VLAN tag to a generated this Ether signal, and an Ether signal with a VLAN tag is generated, including U-CPU part that transmits a generated this Ether signal with a VLAN tag to the mentioned above E-CPU, and the mentioned above TDMA/TDD control part, gets down the mentioned above radio MAC frame that got down and was transmitted from a MAC scheduling processing part, and as a data area, also, give and get down from header areas, such as a subscriber station number and re-synthetic information, to this going down data area, and it is considered as circuit information, while transmitting this to the mentioned above modulation and demodulation part, upstream information transmitted from the mentioned above subscriber station, based on re-synthetic information of a header area of this upstream information, generate a radio MAC frame, and the mentioned above generated radio MAC frame is transmitted to U-CPU based on a subscriber station number of a header area of this upstream information, a base station

characterized by what the mentioned above modulation and demodulation part restores to upstream information that is transmitted from the mentioned above TDMA/TDD control part, and which is transmitted from the mentioned above subscriber station while getting down and modulating circuit information.

[Claim 5] The mentioned above subscriber station in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station when a base station characterized by including the following connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access performs data transfer. A modulation and demodulation part and a TDMA/TDD control part, including a terminal interface part and the mentioned above modulation and demodulation part, from the mentioned above base station, become irregular and upstream information which is transmitted and that is transmitted from the mentioned above TDMA/TDD control part while getting down and restoring to circuit information the mentioned above TDMA/TDD control part, a radio MAC frame is generated based on re-synthetic information of a header area of going down circuit information to this going down circuit information transmitted from the mentioned above modulation and demodulation part, while transmitting

a generated this radio MAC frame to M-CPU part of the mentioned below terminal interface part, go up and a radio MAC frame transmitted from M-CPU of the mentioned below terminal interface part as a data area, also gives header areas, such as a subscriber station number and re-synthetic information, to this going up data area, consider it as upstream information, transmit this to the mentioned above modulation and demodulation part, and the mentioned above terminal interface part, a radio MAC frame that gets down and is transmitted from a buffer, a going up buffer, and the mentioned above TDMA/TDD control is stored in the mentioned above going down buffer, going down processing that deletes a VLAN tag from an Ether signal with a VLAN tag which generated and this generated an Ether signal with a VLAN tag based on re-synthetic information of a header area of a stored this radio MAC frame, and transmits this to a terminal, divides into a radio MAC frame a VLAN Ether signal without tag transmitted from a terminal, and re-synthetic information is given to a this divided radio MAC frame, M-CPU part that performs going up processing that stores in the mentioned above going up buffer and transmits a this stored radio MAC frame to the mentioned above TDMA/TDD control part.

[Claim 6] An Ether signal processing method in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station when a base station characterized by that connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access performs data transfer, including a subscriber station specific step that specifies the mentioned above subscriber station using a VLAN tag of an Ether signal with a VLAN tag with which VID mode management that shows the nontransparent mode or transparent mode is preliminary set as each subscriber station, and the mentioned above base station is transmitted to it from a network, a transfer step to which the mentioned above base station transmits an Ether signal with a VLAN tag transmitted to the mentioned above specified subscriber station from the mentioned above network, the mentioned above subscriber station deletes a VLAN tag of an Ether signal with a VLAN tag transmitted from the mentioned above base station when the mentioned above VID mode management set as this subscriber station was the nontransparent mode, a step that transmits an Ether signal with a VLAN tag that transmitted a VLAN Ether signal without tag to a terminal accommodated in this subscriber station, and was transmitted from the mentioned above base station when the mentioned

above VID mode management set as this subscriber station was transparent mode to a terminal accommodated in this subscriber station.
[Claim 7] The Ether signal processing method according to claim 6 including a step that transmits an Ether signal transmitted from a terminal in which VID mode management that shows the nontransparent mode or transparent mode is preliminary set as each subscriber station, and the mentioned above subscriber station is accommodated in it by this subscriber station to the mentioned above base station, the mentioned above base station gives a VLAN tag to an Ether signal transmitted from a subscriber station to which the nontransparent mode is set as the mentioned above VID mode management, a step that transmits an Ether signal with a VLAN tag transmitted from a subscriber station to which it transmits to the mentioned above network and transparent mode is set as the mentioned above VID mode management to the mentioned above network.
[Claim 8] An Ether signal processing method in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station when a base station characterized by that connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access performs data transfer, including a step in which VID mode management that

shows the nontransparent mode or transparent mode is preliminary set as each subscriber station, the mentioned above base station divides into a fixed-length radio MAC frame an Ether signal with a VLAN tag transmitted from the mentioned above network, and this base station gets down, and is stored in a buffer, a step in which it gets down for the subscriber stations the mentioned above VLAN tag indicates the mentioned above a plurality of divided radio MAC frames to be with reference to a VLAN-subscriber station correspondence table, and the mentioned above base station stores in a subscriber station buffer, a step to which the mentioned above base station adds re-synthetic information for a subscriber station that receives a MAC frame of this plurality to compound a MAC frame of these plurality to the mentioned above a plurality of MAC frames, a step that transmits a plurality of MAC frames to which the mentioned above base station added the mentioned above re-synthetic information to a subscriber station which the mentioned above VLAN tag shows, a step to which the mentioned above subscriber station receives a MAC frame transmitted from the mentioned above base station, a step in which the mentioned above subscriber station compounds the mentioned above a plurality of received MAC frames based on the mentioned above re-synthetic information, and generates the mentioned above Ether signal with a

VLAN tag, by deleting a VLAN tag from the mentioned above generated Ether signal with a VLAN tag, and performing shifting data, when the mentioned above VID mode management by which the mentioned above subscriber station is set as this subscriber station is the nontransparent mode, generates a VLAN Ether signal without tag and a this generated VLAN Ether signal without tag, a step that transmits the mentioned above generated Ether signal with a VLAN tag to a terminal accommodated in this subscriber station when the mentioned above VID mode management set as this subscriber station is transparent mode, while transmitting to a terminal accommodated in this subscriber station.

[Claim 9] When a base station connected to a network and a plurality of subscriber stations to which VID mode management that shows the nontransparent mode or transparent mode was set preliminary perform radio with a Time Division Multiple Access, a terminal connected to the mentioned above network and the mentioned above subscriber station is the mentioned above base station in a system that performs data transfer, including a network interface part, a going down MAC scheduling processing part, an up MAC scheduling processing part, a TDMA/TDD control part, and a modulation and demodulation part, and the mentioned above network interface part, gets down and an Ether signal with a

buffer, a going up buffer, and a VLAN tag is divided into a radio MAC frame, go up the mentioned above Ether signal with a VLAN tag that it gets down and is transmitted to a buffer and which gets down and is transmitted from processing and mentioned below U-CPU and it stores in a buffer, including E-CPU part that performs going up processing that transmits a stored this Ether signal with a VLAN tag to a network, and the mentioned above going down MAC scheduling processing part, scheduling processing for which turn which is prepared for each subscriber station, and which gets down and transmits respectively the mentioned above wireless data which it got down, and was stored and this stored in a subscriber station buffer to a subscriber station for a subscriber station buffer and wireless data is defined is performed, gives a header area to a radio MAC frame, have D-CPU part transmitted to a TDMA/TDD part, and the mentioned above up MAC scheduling processing part, an up subscriber station buffer prepared for each subscriber station and a plurality of radio MAC frames transmitted from TDMA/TDD are stored in the mentioned above up subscriber station buffer, compounds a plurality of stored this radio MAC frames, generates an Ether signal, and a subscriber station number of a subscriber station and a VLAN-subscriber station correspondence table that transmitted a radio MAC frame of this plurality are

referred to, gives a VLAN tag to a generated this Ether signal, and an Ether signal with a VLAN tag is generated, including U-CPU part that transmits a generated this Ether signal with a VLAN tag to the mentioned above E-CPU, and the mentioned above TDMA/TDD control part, gets down the mentioned above radio MAC frame that got down and was transmitted from a MAC scheduling processing part, and as a data area, while giving and getting down from header areas, such as a subscriber station number and re-synthetic information, to this going down data area also considering it as circuit information and transmitting this to the mentioned above modulation and demodulation part, based on re-synthetic information of a header area of this upstream information, a radio MAC frame is generated for upstream information transmitted from the mentioned above subscriber station, based on a subscriber station number of a header area of this upstream information, transmits the mentioned above generated radio MAC frame to U-CPU, and the mentioned above modulation and demodulation part, a base station characterized by what is restored to upstream information which is transmitted from the mentioned above TDMA/TDD control part, and that is transmitted from the mentioned above subscriber station while getting down and modulating circuit information.

[Claim 10] A base station connected to a network, including, the mentioned above subscriber station in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station when a plurality of subscriber stations to which VID mode management that shows the nontransparent mode or transparent mode was set preliminary perform radio with a Time Division Multiple Access performs data transfer, a modulation and demodulation part and a TDMA/TDD control part, a terminal interface part and the mentioned above modulation and demodulation part, from the mentioned above base station, become irregular and upstream information that is transmitted and which is transmitted from the mentioned above TDMA/TDD control part while getting down and restoring to circuit information the mentioned above TDMA/TDD control part, a radio MAC frame is generated based on re-synthetic information of a header area of going down circuit information to this going down circuit information transmitted from the mentioned above modulation and demodulation part, while transmitting a generated this radio MAC frame to M-CPU part of the mentioned below terminal interface part, go up and a radio MAC frame transmitted from M-CPU of the mentioned below terminal interface part as a data area, also gives header areas, such as a subscriber station number and re-synthetic information, to this

going up data area, consider it as upstream information, transmit this to the mentioned above modulation and demodulation part, and the mentioned above terminal interface part, a radio MAC frame that gets down and is transmitted from a buffer, a going up buffer, and the mentioned above TDMA/TDD control is stored in the mentioned above going down buffer, based on re-synthetic information of a header area of a stored this radio MAC frame, generates an Ether signal with a VLAN tag and a VLAN tag of an Ether signal with a VLAN tag transmitted from the mentioned above base station when the mentioned above VID mode management set as this subscriber station was the nontransparent mode is deleted, going down processing that transmits an Ether signal with a VLAN tag which transmitted a VLAN Ether signal without tag to a terminal accommodated in this subscriber station, and was transmitted from the mentioned above base station when the mentioned above VID mode management set as this subscriber station was transparent mode to a terminal accommodated in this subscriber station, divides into a radio MAC frame a VLAN Ether signal without tag transmitted from a terminal, and re-synthetic information is given to a this divided radio MAC frame, M-CPU part that performs going up processing that stores in the mentioned above going up buffer and

transmits a this stored radio MAC frame to the mentioned above TDMA/TDD control part.

[Detailed description of the invention]

[0001]

[Field of the invention] Especially this invention relates to the Ether signal processing method, base station, and subscriber station to which the CPU load of a base station can be reduced about an Ether signal processing method, a base station and a subscriber station.

[0002]

[Description of the prior art] The communications system that provides fixed wireless access service provides a service area large as a whole by generally putting in order many cells which are the comparatively small service areas that used one base station.

[0003] Thus, in such a communications system, although a plurality of wireless circuits are formed between a base station and a plurality of subscriber stations, in order to aim at effective use of frequency, a common frequency channel is used for the wireless circuit of this plurality.

[0004] In order to use common frequency by a plurality of subscriber stations, it is necessary to control so that interference (collision) of a radio signal does not arise. What is necessary is for the difference in air time just to separate a plurality of

communications, in order to keep this interference from arising.

[0005] As this separated communications system, CSMA (Carrier Sense Multiple Access)/CA (Collision Avoidance) and TDMA are known.

[0006] CSMA/CA transmits, after checking that the frequency that uses it by performing carrier sensing based on a receiving level is not used by another station. Thus, it is the mentioned above that CSMA/CA transmits without each subscriber station noticing another station existence, and interference produces it, although it hides and there is a terminal problem, in this specification, CSMA/CA is not stated to details any more.

[0007] In TDMA, all the communications are controlled by a base station, so that interference (collision) of a radio signal does not arise, and the time slot used for the data communications of a base station and a plurality of subscriber stations is managed collectively in a base station too.

[0008] Drawing 5 is a drawing showing the example of composition of the radio frame in the communications system that adopts TDMA/TDD. In drawing 5, TS11 (Time Slot 11) is a field accessible with all the subscriber stations. The control signal for arbitrating the time-slot demand transmitted at random from each subscriber station in frame structure information, information for performing supervisor

control and mentioned below TS14, it is a time zone that notifies the time slot that the base station assigned by time scheduling according to the time-slot demand transmitted from the subscriber station in TS14.

[0009] TS12 is a time zone for getting down that receives each subscriber station from a base station and transmitting the user data of a direction. This time zone is divided in the fixed-length time zone from a viewpoint that uses radio resources effectively and generally secures the fairness between a plurality of subscriber stations. The time zone in consideration of radio error quality and the efficiency of data to transmit is determined.

[0010] TS13 is a time zone for controlling so that the propagation-delay time generated according to the distance difference between a base station and a plurality of subscriber stations is measured, the transmit timing of the radio signal transmitted from each subscriber station is adjusted and a radio signal does not collide in reception of a base station. Transmission of an up supervisory control signal is performed in TS13 too.

[0011] TS14 is a time zone for a subscriber station to require the time slot for user data transmission in the up direction from a base station, according to this demand made in this time slot, a base station assigns the time slot for user data transmission to a subscriber station. And a base station notifies the time slot for

user data transmission to a subscriber station in TS11, and a subscriber station transmits an user data using this notified time slot. TS14 as well as the mentioned above TS12 is divided in the fixed-length time zone.
[0012] TS15 is a time zone for the mentioned above user data transmission. TS16 is guard time for interference prevention that gets down with an upstream and is set as a boundary with a circuit. In the communications system that adopts conventional TDMA/TDD, the following Ether signal processing was performed using the above radio frames.
[0013] Drawing 6 is a drawing showing the conventional example of Ether signal processing (base station). In the base station, the data for specifying VLAN and a subscriber station is set up preliminary. A base station is pinpointed by referring to the associated data of VID and the subscriber station that are preliminary set up in the destination subscriber station of the Ether signal with a VLAN tag received from a network.
[0014] Next, a base station deletes a VLAN tag from an Ether signal with a VLAN tag, performs shifting data, and generates a VLAN Ether signal without tag. A base station gets down from this generated VLAN Ether signal without tag, is divided into the size of a radio MAC frame, and transmits a plurality of this divided radio MAC frames to the mentioned above specified subscriber station.

[0015] Drawing 7 is a drawing showing the conventional example of Ether signal processing (subscriber station). The plurality transmitted through the mentioned above processing gets down from a base station, and a subscriber station compounds a radio MAC frame, and generates the Ether signal of the former VLAN tag. And a subscriber station transmits this generated Ether signal of the former VLAN tag to the terminal accommodated in self (connection).
[0016]
[Problems to be solved by the invention] However, in the mentioned above conventional Ether signal processing method, the base station needs to perform processing that deletes a VLAN tag from this signal whenever it receives an Ether signal with a VLAN tag from a network. Since the VLAN tag is arranged at the head of the Ether signal, the base station needs to perform shifting-data processing about an Ether signal after deleting a VLAN tag.
[0017] Thus, in the mentioned above conventional Ether signal processing method, since the CPU load of the base station was excessive, the problem of the performance of the whole communications system and the fall of a throughput had arisen.
[0018] Next, an object of this invention is to provide the Ether signal processing method, base station, and subscriber station that can reduce the CPU load of a

base station that the performance of the whole communications system should be raised and the fall of a throughput should be prevented in view of this situation.

[0019]

[Means for solving the problem] According to this invention, the mentioned above problem is solved by the mentioned above claim by a means of a statement. Namely, when a base station where the invention according to claim 1 was connected to a network, and a plurality of subscriber stations perform radio with a Time Division Multiple Access, in an Ether signal processing method in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station performs data transfer.

[0020] A subscriber station specific step as which the mentioned above base station specifies the mentioned above subscriber station using a VLAN tag of an Ether signal with a VLAN tag transmitted from a network, a transfer step to which the mentioned above base station transmits an Ether signal with a VLAN tag transmitted to the mentioned above specified subscriber station from the mentioned above network.

[0021] The mentioned above subscriber station is an Ether signal processing method having a deletion step that deletes a VLAN tag of an Ether signal with a

VLAN tag transmitted from the mentioned above base station.

[0022] According to the invention according to claim 1, VLAN tag deletion currently performed in a base station and shifting-data processing accompanying this are conventionally performed by a subscriber station. Thus, according to the invention according to claim 1, since a CPU load of a base station can be distributed to a plurality of subscriber stations, a CPU load of a base station can be reduced.

[0023] In the Ether signal processing method according to claim 1, the invention according to claim 2, a step at which the mentioned above subscriber station transmits an Ether signal transmitted from a terminal accommodated in this subscriber station to the mentioned above base station, it is an Ether signal processing method having a step to which the mentioned above base station gives a VLAN tag to an Ether signal transmitted from the mentioned above subscriber station, and a step at which the mentioned above base station transmits an Ether signal with which this VLAN tag was given to the mentioned above network.

[0024] According to the invention according to claim 2, a VLAN tag is given to an Ether signal by base station when data is transmitted to a network through a base station from a subscriber station. Thus, according to the invention according to claim 2, since

a CPU load of a base station and a CPU load of a subscriber station can be balanced, performance of the whole communications system can be raised.

[0025] In an Ether signal processing method in a system whose terminal connected to the mentioned above network and the mentioned above subscriber station when a base station connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access in the invention according to claim 3 performs data transfer.

[0026] The mentioned above base station divides into a fixed-length radio MAC frame an Ether signal with a VLAN tag transmitted from the mentioned above network, a step that this base station gets down and is stored in a buffer, and a step at which it gets down for the subscriber stations that the mentioned above VLAN tag shows and the mentioned above base station stores the mentioned above a plurality of divided radio MAC frames in a subscriber station buffer with reference to a VLAN-subscriber station correspondence table.

[0027] A step to which the mentioned above base station adds re-synthetic information for a subscriber station that receives a MAC frame of this plurality to compound a MAC frame of these plurality to the mentioned above a plurality of MAC frames, a step that transmits a plurality of MAC frames to which the mentioned above base station added the mentioned

above re-synthetic information to a subscriber station which the mentioned above VLAN tag shows.
[0028] A step to which the mentioned above subscriber station receives a MAC frame transmitted from the mentioned above base station, and a step to which the mentioned above subscriber station compounds the mentioned above a plurality of received MAC frames, and generates the mentioned above Ether signal with a VLAN tag based on the mentioned above re-synthetic information
[0029] When the mentioned above subscriber station deletes a VLAN tag from the mentioned above generated Ether signal with a VLAN tag and performs shifting data, it is an Ether signal processing method including a step that generates a VLAN Ether signal without tag and a step at which the mentioned above subscriber station transmits the mentioned above generated VLAN Ether signal without tag to a terminal accommodated in this subscriber station.
[0030] According to the invention according to claim 3, VLAN tag deletion currently performed in a base station and shifting-data processing accompanying this are conventionally performed by a subscriber station. Thus, according to the invention according to claim 3, since a CPU load of a base station can be distributed to a plurality of subscriber stations, a CPU load of a base station can be reduced.

[0031] The invention according to claim 4 is the mentioned above base station in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station performs data transfer, when a base station connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access.
[0032] Including a network interface part, a going down MAC scheduling processing part, an up MAC scheduling processing part, a TDMA/TDD control part and a modulation and demodulation part and the mentioned above network interface part, gets down and an Ether signal with a buffer, a going up buffer, and a VLAN tag is divided into a radio MAC frame, the mentioned above Ether signal with a VLAN tag that it gets down and is transmitted to a buffer and which gets down and is transmitted from processing and mentioned below U-CPU is gone up, and it has E-CPU part that performs going up processing which transmits to a network an Ether signal with a VLAN tag stored and this stored in a buffer.
[0033] The mentioned above going down subscriber station buffer with which it gets down and a MAC scheduling processing part is prepared for each subscriber station, and scheduling processing that defines turn that transmits the mentioned above wireless data which it got down, and was stored and this stored in a subscriber station buffer to each

subscriber station for wireless data is performed, a header area is given to a radio MAC frame, and it has D-CPU part transmitted to a TDMA/TDD part.

[0034] An up subscriber station buffer with which the mentioned above up MAC scheduling processing part is prepared for each subscriber station, and a plurality of radio MAC frames transmitted from TDMA/TDD are stored in the mentioned above up subscriber station buffer, compounds a plurality of stored this radio MAC frames, generate an Ether signal, and a subscriber station number of a subscriber station and a VLAN-subscriber station correspondence table that transmitted a radio MAC frame of this plurality are referred to, a VLAN tag is given to a generated this Ether signal, and it has U-CPU part that transmits an Ether signal with a VLAN tag which generated and this generated an Ether signal with a VLAN tag to the mentioned above E-CPU.

[0035] While the mentioned above TDMA/TDD control part gets down from the mentioned above radio MAC frame that got down and was transmitted from a MAC scheduling processing part, gives and gets down from header areas, such as a subscriber station number and re-synthetic information, to this going down data area further as a data area, and considers it as circuit information and this is transmitted to the mentioned above modulation and demodulation part.

[0036] Based on re-synthetic information of a header area of this upstream information, a radio MAC frame is generated for upstream information transmitted from the mentioned above subscriber station and the mentioned above generated radio MAC frame is transmitted to U-CPU based on a subscriber station number of a header area of this upstream information.
[0037] The mentioned above modulation and demodulation part is a base station characterized by what is restored to upstream information that is transmitted from the mentioned above TDMA/TDD control part and which is transmitted from the mentioned above subscriber station while getting down and modulating circuit information.
[0038] According to the invention according to claim 4, VLAN tag deletion currently performed in a base station and shifting-data processing accompanying this are conventionally performed by a subscriber station. Thus, according to the invention according to claim 5, since a CPU load of a base station can be distributed to a plurality of subscriber stations, a CPU load of a base station can be reduced.
[0039] The invention according to claim 5 is the mentioned above subscriber station in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station performs data transfer, when a base station connected

to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access,
[0040] Including a modulation and demodulation part a TDMA/TDD control part and a terminal interface part and the mentioned above modulation and demodulation part, from the mentioned above base station, becomes irregular and upstream information that is transmitted and which is transmitted from the mentioned above TDMA/TDD control part while getting down and restoring to circuit information the mentioned above TDMA/TDD control part, a radio MAC frame is generated based on re-synthetic information of a header area of going down circuit information to this going down circuit information transmitted from the mentioned above modulation and demodulation part,
[0041] While transmitting a generated this radio MAC frame to M-CPU part of the mentioned below terminal interface part, go up and a radio MAC frame transmitted from M-CPU of the mentioned below terminal interface part as a data area, also gives header areas, such as a subscriber station number and re-synthetic information, to this going up data area, consider it as upstream information, transmits this to the mentioned above modulation and demodulation part, and the mentioned above terminal interface part, based on re-synthetic information of a header area of the mentioned above radio MAC frame that it got

down, and was stored and this stored in a buffer, an Ether signal with a VLAN tag is generated for a radio MAC frame that gets down and is transmitted from a buffer, a going up buffer and the mentioned above TDMA/TDD control.

[0042] A VLAN tag is deleted from a generated this Ether signal with a VLAN tag, divides into a radio MAC frame a VLAN Ether signal without tag that transmits this to a terminal and which gets down and is transmitted from processing and a terminal, and re-synthetic information is given to this divided radio MAC frame, it is a subscriber station characterized by what it has M-CPU part that performs going up processing that stores in the mentioned above going up buffer and transmits a this stored radio MAC frame to the mentioned above TDMA/TDD control part for.

[0043] According to the invention according to claim 5, VLAN tag deletion currently performed in a base station and shifting-data processing accompanying this are conventionally performed by a subscriber station. Thus, according to the invention according to claim 5, since a CPU load of a base station can be distributed to a plurality of subscriber stations, a CPU load of a base station can be reduced.

[0044] In an Ether signal processing method in a system whose terminal connected to the mentioned above network and the mentioned above subscriber station when a base station connected to a network

and a plurality of subscriber stations perform radio with a Time Division Multiple Access in the invention according to claim 6 performs data transfer.

[0045] VID mode management that shows the nontransparent mode or transparent mode is preliminary set as each subscriber station, a subscriber station specific step as which the mentioned above base station specifies the mentioned above subscriber station using a VLAN tag of an Ether signal with a VLAN tag transmitted from a network, a transfer step to which the mentioned above base station transmits an Ether signal with a VLAN tag transmitted to the mentioned above specified subscriber station from the mentioned above network.

[0046] The mentioned above subscriber station deletes a VLAN tag of an Ether signal with a VLAN tag transmitted from the mentioned above base station when the mentioned above VID mode management set as this subscriber station was the nontransparent mode, a VLAN Ether signal without tag is transmitted to a terminal accommodated in this subscriber station, when the mentioned above VID mode management set as this subscriber station is transparent mode, it is an Ether signal processing method including a step that transmits an Ether signal with a VLAN tag transmitted from the mentioned above base station to a terminal accommodated in this subscriber station.

[0047] According to the invention according to claim 6, a subscriber station of transparent mode does not delete a VLAN tag from an Ether signal with a VLAN tag. Thus, if information that identifies a terminal is adopted as a VLAN tag in the invention according to claim 6, a plurality of terminals can be accommodated in one subscriber station. That is, according to the invention according to claim 6, a subscriber station transmits an Ether signal with a VLAN tag to a terminal as it is, without deleting a VLAN tag.
[0048] Thus, a plurality of terminals can be accommodated in one subscriber station by providing a switching hub that can identify a VLAN tag between a subscriber station and a terminal.
[0049] Thus, in the invention according to claim 6, a terminal that accommodates VID mode management and a VLAN tag information setting and by changing with operation system can be changed flexibly.
[0050] In the Ether signal processing method according to claim 6 the invention according to claim 7, a step that transmits an Ether signal transmitted from a terminal in which VID mode management which shows the nontransparent mode or transparent mode is preliminary set as each subscriber station, and the mentioned above subscriber station is accommodated in it by this subscriber station to the mentioned above base station, the mentioned above base station gives a VLAN tag to an Ether signal

transmitted from a subscriber station to which the nontransparent mode is set as the mentioned above VID mode management.

[0051] It is an Ether signal processing method including a step that transmits an Ether signal with a VLAN tag transmitted from a subscriber station to which it transmits to the mentioned above network and transparent mode is set as the mentioned above VID mode management to the mentioned above network.

[0052] According to the invention according to claim 7, a VLAN tag is given to an Ether signal by base station when data is transmitted to a network through a base station from a subscriber station. Thus, according to the invention according to claim 7, since a CPU load of a base station and a CPU load of a subscriber station can be balanced, performance of the whole communications system can be raised.

[0053] According to the invention according to claim 7, a subscriber station of transparent mode does not delete a VLAN tag from an Ether signal with a VLAN tag. Thus, if information that identifies a terminal is adopted as a VLAN tag in the invention according to claim 7, a plurality of terminals can be accommodated in one subscriber station. That is, according to the invention according to claim 7, a subscriber station transmits an Ether signal with a VLAN tag to a terminal as it is, without deleting a VLAN tag.

[0054] Thus, a plurality of terminals can be accommodated in one subscriber station by providing a switching hub that can identify a VLAN tag between a subscriber station and a terminal.
[0055] Thus, in the invention according to claim 7, a terminal that accommodates VID mode management and a VLAN tag information setting and by changing with operation system can be changed flexibly.
[0056] When a base station connected to a network and a plurality of subscriber stations perform radio with a Time Division Multiple Access, the invention according to claim 8, in an Ether signal processing method in a system by which a terminal connected to the mentioned above network and the mentioned above subscriber station performs data transfer, VID mode management that shows the nontransparent mode or transparent mode to each subscriber station is set up preliminary.
[0057] The mentioned above base station divides into a fixed-length radio MAC frame an Ether signal with a VLAN tag transmitted from the mentioned above network, a step that this base station gets down and is stored in a buffer, and a step at which it gets down for the subscriber stations that the mentioned above VLAN tag shows, and the mentioned above base station stores the mentioned above a plurality of divided radio MAC frames in a subscriber station

buffer with reference to a VLAN-subscriber station correspondence table.
[0058] A step to which the mentioned above base station adds re-synthetic information for a subscriber station that receives a MAC frame of this plurality to compound a MAC frame of these plurality to the mentioned above a plurality of MAC frames, a step that transmits a plurality of MAC frames to which the mentioned above base station added the mentioned above re-synthetic information to a subscriber station that the mentioned above VLAN tag shows, [0059] A step to which the mentioned above subscriber station receives a MAC frame transmitted from the mentioned above base station and a step to which the mentioned above subscriber station compounds the mentioned above a plurality of received MAC frames and generates the mentioned above Ether signal with a VLAN tag based on the mentioned above re-synthetic information.
[0060] By deleting a VLAN tag from the mentioned above generated Ether signal with a VLAN tag, and performing shifting data, when the mentioned above VID mode management by which the mentioned above subscriber station is set as this subscriber station is the nontransparent mode, while generating a VLAN Ether signal without tag and transmitting a this generated VLAN Ether signal without tag to a terminal accommodated in this subscriber station.

[0061] When the mentioned above VID mode management set as this subscriber station is transparent mode, it is an Ether signal processing method having a step which transmits the mentioned above generated Ether signal with a VLAN tag to a terminal accommodated in this subscriber station.
[0062] According to the invention according to claim 8, a subscriber station of transparent mode does not delete a VLAN tag from an Ether signal with a VLAN tag. Thus, if information that identifies a terminal is adopted as a VLAN tag in the invention according to claim 8, a plurality of terminals can be accommodated in one subscriber station. That is, according to the invention according to claim 8, a subscriber station transmits an Ether signal with a VLAN tag to a terminal as it is, without deleting a VLAN tag.
[0063] Thus, a plurality of terminals can be accommodated in one subscriber station by providing a switching hub that can identify a VLAN tag between a subscriber station and a terminal.
[0064] Thus, in the invention according to claim 8, a terminal that accommodates VID mode management and a VLAN tag information setting and by changing with operation system can be changed flexibly.
[0065] When a base station connected to a network and a plurality of subscriber stations to which VID mode management that shows the nontransparent mode or transparent mode was set preliminary

perform radio with a Time Division Multiple Access, the invention according to claim 9, a terminal connected to the mentioned above network and the mentioned above subscriber station is the mentioned above base station in a system which performs data transfer.

[0066] A network interface part, a going down MAC scheduling processing part, an up MAC scheduling processing part, a TDMA/TDD control part, and a modulation and demodulation part, and the mentioned above network interface part, gets down and an Ether signal with a buffer, a going up buffer, and a VLAN tag is divided into a radio MAC frame, the mentioned above Ether signal with a VLAN tag that it gets down and is transmitted to a buffer and which gets down and is transmitted from processing and mentioned below U-CPU is gone up, and it has E-CPU part that performs going up processing that transmits to a network an Ether signal with a VLAN tag stored and this stored in a buffer.

[0067] The mentioned above going down subscriber station buffer with which it gets down and a MAC scheduling processing part is prepared for each subscriber station, and scheduling processing that defines turn which transmits respectively the mentioned above wireless data which it got down, and was stored and this stored in a subscriber station buffer to a subscriber station for wireless data is

performed, a header area is given to a radio MAC frame, and it has D-CPU part transmitted to a TDMA/TDD part.

[0068] An up subscriber station buffer with which the mentioned above up MAC scheduling processing part is prepared for each subscriber station, and a plurality of radio MAC frames transmitted from TDMA/TDD are stored in the mentioned above up subscriber station buffer, compounds a plurality of stored this radio MAC frames, generates an Ether signal, and a subscriber station number of a subscriber station and a VLAN-subscriber station correspondence table that transmitted a radio MAC frame of this plurality are referred to, a VLAN tag is given to a generated this Ether signal and it has U-CPU part tha transmits an Ether signal with a VLAN tag which generated and this generated an Ether signal with a VLAN tag to the mentioned above E-CPU.

[0069] While the mentioned above TDMA/TDD control part gets down from the mentioned above radio MAC frame that got down and was transmitted from a MAC scheduling processing part, gives and gets down from header areas, such as a subscriber station number and re-synthetic information, to this going down data area further as a data area, and considers it as circuit information and this is transmitted to the mentioned above modulation and demodulation part.

[0070] Based on re-synthetic information of a header area of this upstream information, a radio MAC frame is generated for upstream information transmitted from the mentioned above subscriber station, based on a subscriber station number of a header area of this upstream information, transmits the mentioned above generated radio MAC frame to U-CPU, and the mentioned above modulation and demodulation part, it is a base station characterized by what is restored to upstream information that is transmitted from the mentioned above TDMA/TDD control part and which is transmitted from the mentioned above subscriber station while getting down and modulating circuit information.

[0071] According to the invention according to claim 9, a subscriber station of transparent mode does not delete a VLAN tag from an Ether signal with a VLAN tag. Thus, if information that identifies a terminal is adopted as a VLAN tag in the invention according to cla im 9, a plurality of terminals can be accommodated in one subscriber station. That is, according to the invention according to claim 9, a subscriber station transmits an Ether signal with a VLAN tag to a terminal as it is, without deleting a VLAN tag.

[0072] Thus, a plurality of terminals can be accommodated in one subscriber station by providing a switching hub that can identify a VLAN tag between a subscriber station and a terminal.

[0073] Thus, in the invention according to claim 9, a terminal that accommodates VID mode management and a VLAN tag information setting and by changing with operation system can be changed flexibly.
[0074] VID mode management that indicates the nontransparent mode or transparent mode to be the base station where the invention according to claim 10 was connected to a network was set up preliminary. When a plurality of subscriber stations perform radio with a Time Division Multiple Access, a terminal connected to the mentioned above network and the mentioned above subscriber station is the mentioned above subscriber station in a system that performs data transfer.
[0075] A modulation and demodulation part, a TDMA/TDD control part, and a terminal interface part, and the mentioned above modulation and demodulation part, from the mentioned above base station, become irregular and upstream information that is transmitted and which is transmitted from the mentioned above TDMA/TDD control part while getting down and restoring to circuit information the mentioned above TDMA/TDD control part, while transmitting a radio MAC frame that is transmitted from the mentioned above modulation and demodulation part and which got down, generated a radio MAC frame based on re-synthetic information of a header area of circuit information to this going

down circuit information, and was this generated to M-CPU part of the mentioned below terminal interface part.
[0076] A radio MAC frame transmitted from M-CPU of the mentioned below terminal interface part is gone up, and as a data area, header areas, such as a subscriber station number and re-synthetic information, are further given to this going up data area, it is considered as upstream information and this is transmitted to the mentioned above modulation and demodulation part, [0077] The mentioned above terminal interface part stores in the mentioned above going down buffer a radio MAC frame which gets down and is transmitted from a buffer, a going up buffer, and the mentioned above TDMA/TDD control; based on re-synthetic information of a header area of a stored this radio MAC frame, generate an Ether signal with a VLAN tag and a VLAN tag of an Ether signal with a VLAN tag transmitted from the mentioned above base station when the mentioned above VID mode management set as this subscriber station was the nontransparent mode is deleted, a VLAN Ether signal without tag is transmitted to a terminal accommodated in this subscriber station.
[0078] Going down processing that transmits an Ether signal with a VLAN tag transmitted from the mentioned above base station to a terminal accommodated in this subscriber station when the

mentioned above VID mode management set as this subscriber station is transparent mode, divides into a radio MAC frame a VLAN Ether signal without tag transmitted from a terminal, and re-synthetic information is given to a this divided radio MAC frame, it is a subscriber station characterized by what it has M-CPU part that performs going up processing which stores in the mentioned above going up buffer and transmits a this stored radio MAC frame to the mentioned above TDMA/TDD control part for.

[0079] According to the invention according to claim 10, a subscriber station of transparent mode does not delete a VLAN tag from an Ether signal with a VLAN tag. Thus, if information that identifies a terminal is adopted as a VLAN tag in the invention according to claim 10, a plurality of terminals can be accommodated in one subscriber station. That is, according to the invention according to claim 10, a subscriber station transmits an Ether signal with a VLAN tag to a terminal as it is, without deleting a VLAN tag.

[0080] Thus, a plurality of terminals can be accommodated in one subscriber station by providing a switching hub that can identify a VLAN tag between a subscriber station and a terminal.

[0081] Thus, in the invention according to claim 10, a terminal that accommodates VID mode management and a VLAN tag information setting and by changing with operation system can be changed flexibly.
[0082]
[Embodiment of the invention] With reference to an accompanying drawing, the suitable embodiment of this invention is described in details below. Drawing 4 is a drawing showing an example of the communications system that applies an embodiment of the invention. The base station 11 is connected to the network (IP network). Radio of the base station 11 is carried out to the subscriber station 21 - the subscriber station 23 by the antenna 12. A Time Division Multiple Access is adopted as this communication.
[0083] Drawing 1 is a drawing showing the base station according to the 1st embodiment of this invention. In drawing 1, it divides into a fixed-length radio MAC frame, a base station gets down, and a base station stores in a buffer the Ether signal with a VLAN tag transmitted from the mentioned above network.
[0084] With reference to a VLAN-subscriber station correspondence table, it gets down for the subscriber stations which a VLAN tag shows from a plurality of divided radio MAC frames and a base station is stored in a subscriber station buffer.

[0085] Although it can consider the thing to which VLAN and the subscriber station number of the subscriber station were made to correspond, a VLAN-subscriber station correspondence table is anything good if a subscriber station to VLAN is a subscriber station discriminable from VLAN.

[0086] A base station adds re-synthetic information for the subscriber station that receives a plurality of MAC frames to compound the MAC frame of these plurality to a plurality of MAC frames. It is for compounding a plurality of radio MAC frames in a subscriber station, since the Ether signal with a VLAN tag is divided into plurality and transmitted to each subscriber station, and generating an Ether signal with a VLAN tag.

[0087] Although the information that divided the Ether signal into the radio MAC frame can be used as this re-synthetic information, it is not restricted to this. Thus, if re-synthetic information is information that can carry out reproduction of the divided Ether signal, it is anything good.

[0088] A base station transmits a plurality of MAC frames that added re-synthetic information to the subscriber station that a VLAN tag shows. In the above, although the base station according to the 1st embodiment of this invention was explained, it explains still in details about this base station next.

[0089] The base station has a network interface part, a going down MAC scheduling processing part, an up MAC scheduling processing part, a TDMA/TDD control part and a modulation and demodulation part.
[0090] It got down and this network interface part is provided with the going up buffer that stores the buffer and the data transmitted from the subscriber station that store the data transmitted to a subscriber station. The network interface part is provided with E-CPU part that gets down and performs processing and going up processing. Here, it gets down, processing divides an Ether signal with a VLAN tag into a radio MAC frame, and the mentioned above processing that it gets down and is transmitted to a buffer is the mentioned above. Up processing goes up the Ether signal with a VLAN tag transmitted from mentioned below U-CPU, and the processing that transmits to a network the Ether signal with a VLAN tag stored and this stored in the buffer is the mentioned above.
[0091] It gets down and the MAC scheduling processing part has a going down subscriber station buffer prepared for each subscriber station. It gets down and the MAC scheduling processing part has D-CPU part. Here, D-CPU part gets down from wireless data, performs scheduling processing that defines the turn which transmits the wireless data stored and stored in the subscriber station buffer to each

subscriber station, gives a header area to a radio MAC frame and transmits it to a TDMA/TDD part.
[0092] What is necessary is just to operate a scheduling processing part by round control, for example, in securing the fairness of the turn of the data transfer from a base station to each subscriber station.
[0093] The up MAC scheduling processing part is provided with the up subscriber station buffer prepared for each subscriber station. The up MAC scheduling processing part is provided with U-CPU part. U-CPU part goes up a plurality of radio MAC frames transmitted from TDMA/TDD, and stores them in a subscriber station buffer, compounding a plurality of stored radio MAC frames, generating an Ether signal, and the subscriber station number of a subscriber station and VLAN-subscriber station correspondence table that transmitted a plurality of radio MAC frames are referred to, a VLAN tag is given to the generated Ether signal and the Ether signal with a VLAN tag which generated and generated the Ether signal with a VLAN tag is transmitted to E-CPU.
[0094] A TDMA/TDD control part gets down from the radio MAC frame that got down and was transmitted from the MAC scheduling processing part, gives and gets down from header areas, such as a subscriber station number and re-synthetic

information, to this going down data area further as a data area, considers it as circuit information, and transmits this to the mentioned above modulation and demodulation part.

[0095] The upstream information to which a TDMA/TDD control part is transmitted from a subscriber station, a radio MAC frame is generated based on the re-synthetic information of the header area of upstream information, and the generated radio MAC frame is transmitted to U-CPU of the mentioned above up MAC scheduling processing part based on the subscriber station number of the header area of upstream information. A modulation and demodulation part modulates the going down circuit information transmitted from a TDMA/TDD control part. A modulation and demodulation part restores to the upstream information transmitted from a subscriber station.

[0096] Drawing 2 is a drawing showing the subscriber station according to the 1st embodiment of this invention. A subscriber station receives the MAC frame transmitted from the base station. A subscriber station compounds a plurality of received MAC frames based on re-synthetic information and generates an Ether signal with a VLAN tag.

[0097] A subscriber station deletes a VLAN tag from this generated Ether signal with a VLAN tag, performs shifting data and generates a VLAN Ether

signal without tag. A subscriber station transmits the generated VLAN Ether signal without tag to the terminal accommodated in this subscriber station.
[0098] In the above, although the subscriber station according to the 1st embodiment of this invention was explained, it explains still in detail about this subscriber station next. A subscriber station has a modulation and demodulation part, a TDMA/TDD control part and a terminal interface part.
[0099] A modulation and demodulation part restores to the going down circuit information transmitted from the mentioned above base station. A modulation and demodulation part modulates the upstream information transmitted from a TDMA/TDD control part. A TDMA/TDD control part transmits the radio MAC frame that is transmitted from a modulation and demodulation part and which got down, got down and generated and this generated the radio MAC frame from circuit information based on the re-synthetic information of the header area of circuit information to M-CPU part of the mentioned below terminal interface part.
[0100] A TDMA/TDD control part goes up the radio MAC frame transmitted from M-CPU of the mentioned below terminal interface part, as a data area, gives header areas, such as a subscriber station number and re-synthetic information, further to this going up data area, considers it as upstream

information, and transmits this to the mentioned above modulation and demodulation part.

[0101] It got down and the terminal interface part is provided with the going up buffer that stores the buffer and the data transmitted from a terminal that store the data transmitted from a base station. The terminal interface part is provided with M-CPU part which gets down and performs processing and going up processing. Get down from the radio MAC frame transmitted from TDMA/TDD control with processing here and it stores in a buffer, based on the re-synthetic information of the header area of the stored radio MAC frame, a VLAN tag is deleted from the Ether signal with a VLAN tag that generated and generated the Ether signal with a VLAN tag, and the processing that transmits this to a terminal is the mentioned above.

[0102] With up processing, the VLAN Ether signal without tag transmitted from a terminal is divided into a radio MAC frame, re-synthetic information is given to the this divided radio MAC frame, and the processing that transmits the radio MAC frame stored and this stored in the mentioned above going up buffer to the mentioned above TDMA/TDD control part is the mentioned above.

[0103] Drawing 3 is a drawing showing the 2nd embodiment of this invention. In drawing 3, it divides into a fixed-length radio MAC frame, this base station

gets down, and a base station stores in a buffer the Ether signal with a VLAN tag transmitted from the network.

[0104] With reference to a VLAN-subscriber station correspondence table, it gets down for the subscriber stations that a VLAN tag shows from a plurality of divided radio MAC frames, and a base station is stored in a subscriber station buffer.

[0105] A base station adds re-synthetic information for the subscriber station that receives the MAC frame of this plurality to compound the MAC frame of these plurality to the mentioned above a plurality of MAC frames.

[0106] A base station transmits a plurality of MAC frames that added synthetic information to the subscriber station that a VLAN tag shows. A subscriber station receives the MAC frame transmitted from the base station. A subscriber station compounds a plurality of received MAC frames based on re-synthetic information and generates an Ether signal with a VLAN tag.

[0107] In this embodiment, the VID mode management that shows the nontransparent mode or transparent mode preliminary to each subscriber station is set up. When the VID mode management set as the subscriber station is the nontransparent mode, a subscriber station, by deleting a VLAN tag from the generated Ether signal with a VLAN tag, and

performing shifting data, a VLAN Ether signal without tag is generated and the generated VLAN Ether signal without tag is transmitted to the terminal accommodated in the subscriber station.
[0108] On the other hand, a subscriber station transmits the generated Ether signal with a VLAN tag to the terminal accommodated in the subscriber station, when the VID mode management set as the subscriber station is transparent mode. As shown on drawing 3, a plurality of members can be accommodated in the subscriber station by which transparent mode is set as VID mode management. In this case, a subscriber station transmits an Ether signal with a VLAN tag to the terminal that identifies the terminal which self accommodates based on a VLAN tag, and is identified with this VLAN tag.
[0109]
[Effect of the invention] As explained above, according to this invention, the CPU load of a base station can be reduced. Thus, according to this invention, the performance of the whole communications system can be raised and the fall of a throughput can be prevented.
[0110] In this invention, a plurality of terminals can be accommodated in the subscriber station to which transparent mode was set. Thus, according to this invention, by changing transparent mode and the nontransparent mode, a subscriber station can be made

into the subscriber station that accommodates a single user or it can be made the subscriber station that accommodates a plurality of users.

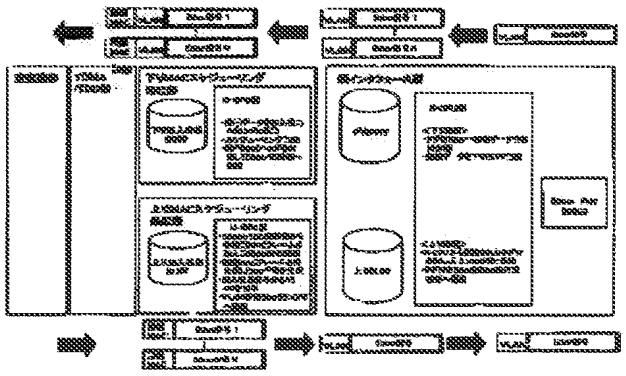
[Brief description of the drawings]

[Drawing 1] is a drawing showing the base station according to the 1st embodiment of this invention.
[Drawing 2] is a drawing showing the subscriber station according to the 1st embodiment of this invention.
[Drawing 3] is a drawing showing the 2nd embodiment of this invention.
[Drawing 4] is a drawing showing an example of the communications system that applies an embodiment of the invention.
[Drawing 5] is a drawing showing the example of composition of the radio frame in the communications system that applies TDMA/TDD.
[Drawing 6] is a drawing showing the conventional example of Ether signal processing (base station).
[Drawing 7] is a drawing showing the conventional example of Ether signal processing (subscriber station).

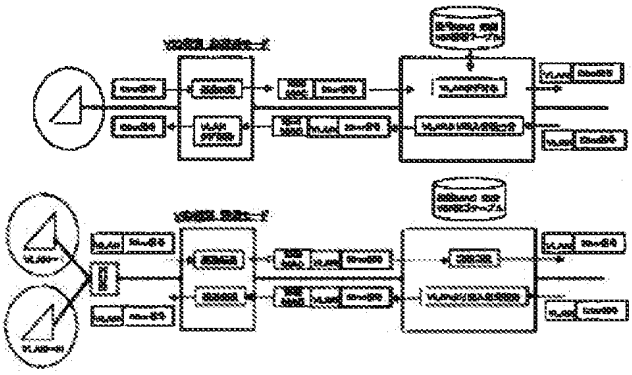
[Description of numerals]

11 Base station
12 Antenna
21 (1) Subscriber station
21 (2) Subscriber station
21 (3) Subscriber station
22 (1) Antenna
22 (2) Antenna
22 (3) Antenna
TS11 Down header area
TS12 Down data area
TS13 DMF field
TS14 Slot demand field
TS15 Up data area
TS16 Guard time

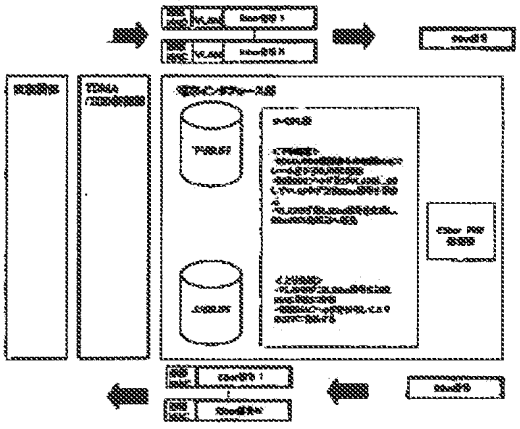
Drawing 1



Drawing 3



Drawing 2



Drawing 5